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### *Case Control Study*

**Elevated serum growth differentiation factor 15 in multiple system atrophy patients: A case control study**

Yue T *et al.* Elevated serum GDF15 in MSA

Tao Yue, Hui Lu, Xiao-Mei Yao, Xia Du, Ling-Ling Wang, Dan-Dan Guo, Yi-Ming Liu

### **Abstract**

#### BACKGROUND

Multiple system atrophy (MSA) is a serious progressive neurodegeneration disease, while the early diagnosis is very difficult, and the diagnostic biomarkers are limited. Growth differentiation factor 15 (GDF15) is involved in the differentiation and progression of central nervous system, and is

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Multiple system atrophy (MSA) is a rare sporadic progressive neurodegenerative disorder. MSA risk factors are poorly known. The objectives of this case-control study were to study environmental ...

### Multiple system atrophy: cellular and molecular pathology

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1187133>

Multiple system atrophy is an adult onset neurodegenerative disease, featuring parkinsonism, ataxia, and autonomic failure, in any combination. The condition is relentlessly progressive and responds poorly to treatment. Death occurs on average six to seven years after the onset of symptoms.

Cited by: 128 Author: D J Burn, E Jaros

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cytokine/chemokine/growth factor profiles in MSA-C and compared them with those in hereditary spinocerebellar ataxia (SCA). Methods: We collected clinical data and CSF from 20 MSA-C patients, 12 hereditary SCA patients, and 15 patients with other non-inflammatory neurological diseases (OND), and measured 27 cytokines/chemokines/growth factors using a

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Cited by: 60 Author: Bruno Di Marco Vieira, Rowan A. Radford, R...

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### Cytokine profiling in the prefrontal cortex of Parkinson's ...

<https://www.sciencedirect.com/science/article/pii/S0969996117301651>

Major histocompatibility complex (MHC) class II, CD45 and CD3 reactivity in the dorsomedial prefrontal cortex of Parkinson's Disease (PD), and Multiple System Atrophy (MSA) patients as well as normal controls (NCs). Formalin-fixed paraffin-embedded tissue samples were investigated using immunohistochemistry. A: Example of MHC class II + cell (arrow).

Cited by: 13 Author: Rasmus Rydbirk, Betina Elfving, Mille Dahl ...

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### Clinical correlates of serum insulin-like growth factor-1 ...

<https://www.sciencedirect.com/science/article/pii/S1353802013003970>

Recently, increased serum insulin-like growth factor-1 (IGF-1) levels have been reported in patients with Parkinson's disease (PD) and multiple system atrophy (MSA). Objective To assess a correlation between the serum IGF-1 levels and clinical background factors in patients with PD and related disorders such as MSA and progressive supranuclear ...

Cited by: 27 Author: Ayaka Numao, Keisuke Suzuki, Masayuki M...

Publish Year: 2014

### The pathogenesis linked to coenzyme Q10 insufficiency in ...

<https://www.nature.com/articles/s41598-018-32573-1>

Sep 21, 2018 · The pathogenesis linked to coenzyme Q10 insufficiency in iPSC-derived neurons from patients with multiple-system atrophy. ... in serum-free growth medium ... a case ??? control study ...

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<https://europepmc.org/article/MED/20176597>

Feb 22, 2010 · Clinical correlates of serum insulin-like growth factor-1 in patients with Parkinson's disease, multiple system atrophy and progressive supranuclear palsy. Numao A , Suzuki K , Miyamoto M , Miyamoto T , Hirata K

### Serum Insulin-Like Growth Factor-1 in Patients with De ...

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4684362>

Insulin-like growth factor-1 (IGF-1) is reported to be neuroprotective in the setting of Parkinson's disease (PD), and there is increasing interest in the possible association of serum IGF-1 levels with PD patients, but with conflicting results.

### Lipid dysfunction and pathogenesis of multiple system atrophy

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3922275>

Epidemiology of multiple system atrophy: a prevalence and pilot risk factor study in Aquitaine, France. Neuroepidemiology. 2004; 2 (4):201-208. doi: 10.1159/000078506. Seo JH, Yong SW, Song SK, Lee JE, Sohn YH, Lee PH. A case-control study of multiple system atrophy in Korean patients. Mov Disord.

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**Cited by:** 9      **Author:** Fumiko Kusunoki Nakamoto, Satoshi Ok...

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